

Remarks

Claims 1-3, 5-28 and 32-37 are pending in this application. Claims 1-3, 5-10 and 32-35 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski et al. US patent no. 6,157,747 in view of Luken US patent no. 5,923,334 and further in view of Katayama et al. US Pub. no. 2002/0081019 Al. Claims 11, 12, 22-28 and 36 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski et al. US patent no. 6,157,747 in view of Katayama et al. US Pub. no. 2002/0081019 Al. Claims 13-21 and 37 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski et al. US patent no. 6,157,747 view of Katayama et al. US Pub. no. 2002/0081019 Al and further in view of Blank US patent no. 5,469,536.

The Applicant appreciates the opportunity for the telephonic interview held between Applicant's attorney, John Conway, and the Examiner on August 21, 2007. The Katayama reference was discussed as combined with the Szeliski and Luken references. Applicant's attorney pointed out that Katayama's method relies on exact camera posture information associated with each of a series of images of an object to determine the shape of a 3D object and that such information is not available from the mosaiced image generated by the combination of Szeliski's method and Luken's method. Thus, the methods of these references are not combinable to achieve the embodiment of Claim 1. No agreement was reached during the interview.

Claims 1, 5, 12, 18, 22, and 36 have been amended to correct typographical errors. No new matter has been added.

Claim Rejections – 35 U.S.C § 103(a)

A. Claims 1-3, 5-10 and 32-35 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski et al., US patent no. 6,157,747, in view of Luken, US patent no. 5,923,334, and further in view of Katayama et al., US Pub. no. 2002/0081019 A1.

The rejection of Claims 1-3, 5-10 and 32-35 under 35 U.S.C. 103(a) as being unpatentable over Szeliski et al., US patent no. 6,157,747, in view of Luken, US patent no. 5,923,334, and further in view of Katayama et al., US Pub. no. 2002/0081019 A1, lacks a prima facie case of obviousness because there is no reasonable expectation of success in combining the teachings of these three references.

Claim 1 of the subject application requires (in part):

“...creating a three dimensional model of the visual scene from the transformed and aligned image panoramas using the reference coordinate system, wherein creating a three dimensional model includes identifying a selected object in the transformed and aligned image panoramas and associating geometry information with the selected object, the geometry information comprising 3-D coordinates describing the position and orientation of the selected object in the reference coordinate system.”

The Office Action admits that:

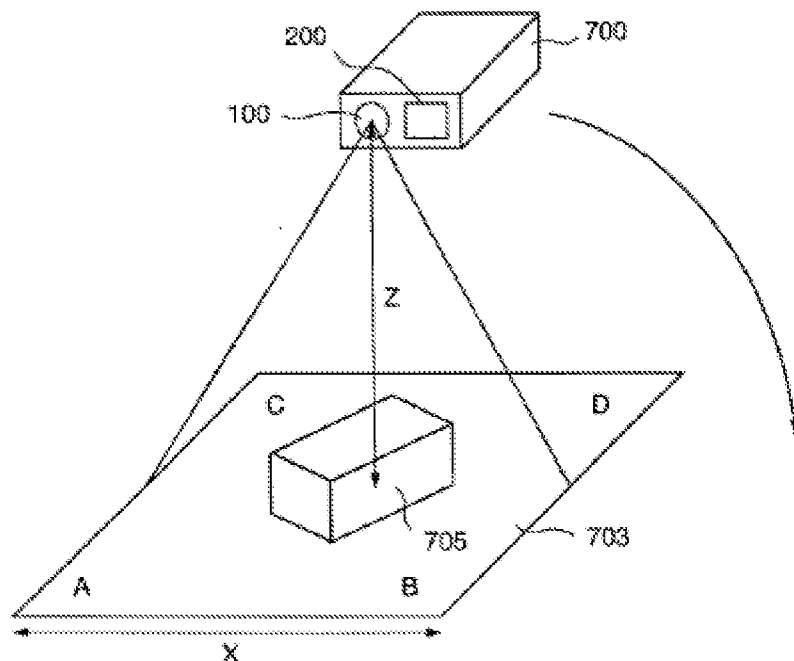
“Szeliski and Luken do not directly teach a method wherein creating a three dimensional model includes identifying a selected object in the transformed and aligned image panoramas and associating geometry information with the selected object, the geometry information comprising 3-D coordinates

describing the position and orientation of the selected object in the reference coordinate system.”

See, Office Action, page 3, para. 4.

On the other hand, Katayama '019 teaches a method for extracting 3D shape information from a series of images of a 3D object. Katayama's apparatus for acquiring the images on which to perform the extraction is shown in fig. 9 of Katayama '019, for an embodiment where the images are acquired using a single camera system. (Katayama '019's embodiment that uses a dual camera system, as shown in fig. 2, is discussed below on page 16 of this response.)

FIG. 9



Katayama's system, shown in fig. 9, uses the marks "A", "B", "C", and "D" printed on a background paper **703** to establish the camera posture (i. e., position and orientation of the camera **700**). (See, Katayama '019, paras. 159 and 163). The camera is moved in the direction of the arrow and a series of images are taken. (See, fig. 11, steps s25 to s28.). Katayama then extracts the 3D coordinates of the object **705** (Katayama '019, paras. 169) from the images and the posture of the camera, as determined for each image. Katayama's method requires determination of the exact camera posture, from the marks (i.e., "A", "B", "C", and "D") on the background paper. (Katayama '019, para. 156.) Without these reference marks in the background of the image,

Katayama's method will not work, since step S26, "detect posture" cannot be performed. Thus, Katayama's method is not combinable with the methods of Szeliski and Luken because neither Szeliski's nor Luken's method provides images with the alignment marks that are needed to determine the camera posture for Katayama's extraction method. Please note that exact camera posture determination for the acquired image is but one of the prerequisite's for Katayama's method of extracting 3D shape information that are not satisfied by Szeliski or Luken's methods. Other prerequisites not satisfied by Szeliski's or Luken's methods include adjustment of camera parameters and acquiring a series of images from different camera postures (Katayama '019, paras. 143 to 149.)

To establish prima facie obviousness of a claimed invention, there must be a reasonable expectation of success in combining the teachings. (See, e.g., MPEP 2143). As shown above, no reasonable expectation of success exists in combining Katayama's method of object extraction with the methods of Szeliski and Luken, because Szeliski's and Luken's images do not allow Katayama's camera posture detection step to be performed successfully. Therefore, Claim 1 is deemed non-obvious over Szeliski '747, Luken '334 and Katayama '019 because a prima facie case of obviousness is lacking. Claims 2-3 and 5-10 depend from Claim 1 and add further limitations. These Claims are deemed non-obvious over Szeliski '747, Luken '334 and Katayama '019 for at least the same reasons as Claim 1.

Claim 32 is deemed non-obvious over Szeliski '747, Luken '334 and Katayama '019 for the same reasons as for Claim 1 because Claim 32 contains claim limitations analogous to the claim limitations cited above for Claim 1. Claims 33-35, which depend from Claim 32 and add further limitations, are deemed non-obvious over Szeliski '747 in view of Luken '334 and Katayama '019 for at least the same reasons as for Claim 32.

B. Claims 11, 12, 22-28 and 36 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski et al., US patent no. 6,157,747, in view of Katayama et al., US Pub. no. 2002/0081019 A1.

The rejection of Claims 11, 12, 22-28 and 36 as amended, under 35 U.S.C. 103(a) as being unpatentable over Szeliski et al. US patent no. 6,157,747 in view of Katayama et al. US Pub. no. 2002/0081019 A1 lacks a prima facie case of obviousness because there is no reasonable expectation of success in combining the teachings of these references.

Claims 11 requires (in part).

“...identifying a selected object in the image panorama and associating geometry information with the selected object, the geometry information comprising 3-D coordinates describing the position and orientation of the selected object in a reference coordinate system;..”

The Office Action admits on page 7, paragraph 2 that:

“Szeliski does not directly teach a method wherein creating a three dimensional model includes identifying a selected object in the image panorama and associating geometry information with the selected object, the geometry

information comprising 3-D coordinates describing the position and orientation of the selected object in the reference coordinate system.”

As shown above for Claim 1, no reasonable expectation of success exists in combining Katayama ‘019’s method of object extraction with the method of Szeliski because Szeliski’s images do not allow Katayama’s camera posture detection step to be performed successfully. Thus, a prima facie case of obviousness is lacking for the combination of Szeliski ‘747 with Katayama ‘019. Therefore, Claim 11 is deemed non-obvious over Szeliski ‘747 and Katayama ‘019. Because Claim 12 depends from Claim 11 and adds further limitations, Claim 12 is also deemed non-obvious over Szeliski ‘747 and Katayama ‘019 for at least the same reasons as for Claim 11.

Further, Claims 22 and 36 are deemed non-obvious over Szeliski ‘747 and Katayama ‘019 for the same reasons as for Claim 11, because Claims 22 and 36 contains claim limitations analogous to the claim limitations cited above for Claim 11. Claims 23-28, which depend from Claim 22 and add further limitations, are deemed non-obvious over Szeliski ‘747 in view of Katayama ‘019 for at least the same reasons as for Claim 22.

C. Claims 13-21 and 37 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski et al. US patent no. 6,157,747 view of Katayama et al. US Pub. no. 2002/0081019 A1 and further in view of Blank, US patent no. 5,469,536.

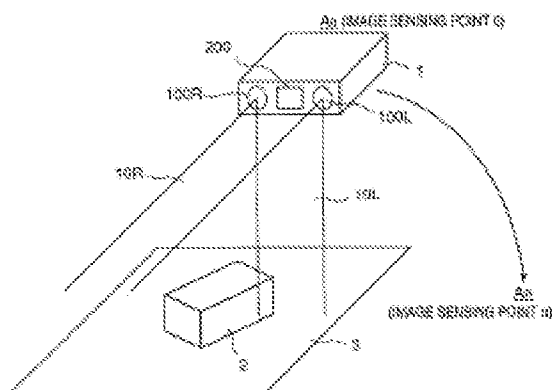
The rejection of Claims 13-21 and 37 under 35 U.S.C. 103(a) as being obvious over Szeliski '747 in view of Katayama '019 and Blank '536 lacks a prima facie case of obviousness because there is no reasonable expectation of success in combining the teachings of these references.

The rejections of Claims 13-21 and 37 for obviousness rely on Szeliski '747 and Katayama '019 for teaching the limitations of Claims 11 and 36 from which these claim depend, respectively. As shown above, the combination of Szeliski '747 and Katayama '019 do not yield a prima facie case of obviousness because there is no reasonable expectation of success in combining these references to achieve the cited limitations of Claims 11 and 36. Further, Blank '536 provides no teaching that increases the expectation of success in combining the teachings of Szeliski and Katayama in achieving the cited limitations of claims 11 and 36. Because Claims 13-21 and 37 depend from Claims 11 and 36, respectively, and add further limitations, Claims 13-21 and 37 are deemed non-obvious over Szeliski '747 in view of Katayama '019 and Blank '536 for at least the same reasons as for Claim 11 and 36, respectively.

Katayama '019's Dual Camera Embodiment

Fig. 2 of Katayama '019 shows the dual camera embodiment of Katayama's object extractor.

FIG. 2



Katayama's method depends on determination of the camera pose (i.e., position in space and orientation) for each of the images taken by the dual image capture camera **1**. Katayama uses a hardware-based posture detector (labeled "201" in fig. 3 of Katayama '019 and not shown in fig. 2) to determine the camera pose in this embodiment. (See, Katayama '019, para. 88.) Without the information provided by the posture detector, Katayama's method of object extraction fails because camera posture must be combined with the image signals from sensors 100L and 100R to calculate object coordinates. (See, Katayama '019 step "S17" in fig. 5B and para. 150.) Because neither Szeliski's nor Luken's images provide such posture information for the images, there is no expectation of success in combining the teachings of Szeliski, Luken and Katayama. This follows because a key ingredient, camera posture, is missing which is needed to perform Katayama's method of object extraction.

Applicant requests reconsideration of all pending claims and a notice of allowance. The Examiner is requested to telephone the undersigned if any matters remain outstanding so that they may be resolved expeditiously. The Commissioner is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith to our Deposit Account No. 19-4972.

Respectfully submitted,

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